

CALIFORNIA WATER PLAN NEWS

March 1998

Contents Highlights

Public Review Draft, California Water Plan Update	1
Industrial Water Use Survey	3
Industrial Water Use Example	5
California Rivers	6
Effects of El Niño on California Seals and Sea Lions	8
Inflatable Dams	10
Status Update — Studies to Enlarge Shasta Dam	11
Evolution of Fair Oaks Water District	13

California Water Plan News is a publication of the Department of Water Resources' statewide planning program. One of the program's major activities is updating the California Water Plan (Bulletin 160) every five years. As part of this work, DWR staff collect and analyze data on land and water use, and forecast future conditions affecting statewide water supplies and demands. This newsletter describes data and forecasting techniques associated with statewide water supply planning. It also provides an overview of conditions or developments influencing planning at the state level. We welcome your questions and comments on material presented here.

California Water Plan News
Division of Planning and Local Assistance
P.O. Box 942836
Sacramento, CA
94236-0001
<http://rubicon.water.ca.gov>

Jeanine Jones, Chief
Statewide Planning Branch
Division of Planning and Local Assistance
(916) 653-3937

Public Review Draft, California Water Plan Update

A draft of the Department's *California Water Plan* update, Bulletin 160-98, was released for public review at the end of January. The Department publishes a plan update every five years. The Bulletin 160 series assesses California's agricultural, environmental, and urban water needs and evaluates water supplies to quantify the gap between forecasted future water demands and the corresponding water supplies. The 1998 update focuses on evaluation of actions that could be taken to improve the reliability of California's water supplies and illustrates how water purveyors statewide are planning to meet future water shortages.

Bulletin 160-98 uses a planning horizon of 1995 to 2020 and evaluates water shortages under average hydrologic conditions and drought hydrologic conditions. The bulletin estimates that average water year shortages are 1.6 million acre-feet and drought year shortages are 5.2 maf at a 1995 level of development. (Groundwater overdraft is included in the shortage amounts.) California's water shortages are forecasted to grow to 2.9 maf in average water years and 7 maf in drought years by 2020 if no actions are taken to improve existing water supplies. Table 1 shows the geographic distribution of these shortages.

About one of every eight residents of the United States now lives in California. The Department of Finance forecasts that California's population will grow to 47.5 million people by 2020, an increase of over 15 million people. This increase is roughly equivalent to adding the current popula-

continued on page 2

California Water Plan Update (continued from page 1)

tions of Arizona, Nevada, Oregon, Idaho, Wyoming, Colorado, and Utah to California.

Bulletin 160-98 includes an appraisal-level review of options available to reduce forecasted shortages. The bulletin evaluates water management options for each of the State's ten major hydrologic regions and combines the regional plans with options that are statewide in scope (such as fixing the Delta) to form a statewide plan. Water management options available to, and being considered by, local agencies form the building blocks of the regional plans. (Supplies provided by local agencies

represent about 70 percent of California's developed water supplies.)

If water purveyors throughout the State—at all levels of government—implement actions identified as likely to be taken by 2020 (including fixing the Delta and carrying out a Colorado River 4.4 maf plan), forecasted water shortages would be reduced but not eliminated. Implementing water conservation, water recycling, desalting, conjunctive use, reoperation of existing facilities, and new storage and conveyance projects would reduce forecasted 2020 shortages to 1.4 maf in average water years and 3.9 maf in drought years.

Jeanine Jones, Chief
Statewide Planning Branch

Table 1. Water Shortages by Hydrologic Region
(thousand acre-feet)

Region	1995		2020	
	Average	Drought	Average	Drought
North Coast	0	177	0	194
San Francisco Bay	0	349	0	376
Central Coast	214	282	177	273
South Coast	0	568	728	1,295
Sacramento River	111	867	206	1,109
San Joaquin River	239	788	805	1,481
Tulare Lake	870	1,862	735	1,866
North Lahontan	0	128	10	128
South Lahontan	89	92	184	210
Colorado River	69	95	79	88
Total (rounded)	1,590	5,210	2,920	7,020

Industrial Water Use Survey

Scott Matyac is a senior land and water use analyst with the Statewide Planning Branch.

The accuracy of urban water use forecasts can be enhanced by breaking down total urban use into components such as residential, commercial, industrial, or institutional water use. The Department periodically surveys industrial water use as part of its overall program to quantify and forecast statewide water use. The most recent update was a 1994 survey, in which detailed questionnaires were sent to more than 2,600 plants. Each company participating in the survey was asked to provide data on water use, number of employees, and industry classification for its California plants. A report covering the survey procedure and resultant data is planned for

publication in 1998. The report will include a county-by-county evaluation of industrial water intake and consumptive use, recirculation, and use of reclaimed water.

Industrial water use includes water used for processing, washing, and cooling. Major water-using industries in California include food processing, petroleum refining, lumber and wood production, paper production, and chemical manufacturing. The volume of water used for industrial purposes in California has changed little over the past 20 years, even as the total number of plants has increased. This increase in water use efficiency is due largely to improved cooling tower technology (to increase recirculation and reduce required make-up water) and the cost of treating plant effluent to comply with

continued on page 4

Errata—Solano County Land Use Survey Report

The last issue of the newsletter had an article summarizing findings of the Department's recent Solano County land use survey report. The summary incorrectly stated that delivery of State Water Project supplies to the study area in the 1970s was responsible for the large change in acreage of irrigated wheat. The text should have stated that reasons for the increase in irrigated acreage were not apparent. SWP water was not delivered to the study area in the 1970s for agricultural use.

Industrial Water Use Survey (continued from page 3)

increasingly strict discharge requirements. The overall proportion of industrial water use has declined to about 9 percent of California's total urban fresh water supply, compared to about 20 percent in 1980, due largely to the increasing water demand in other urban sectors.

Unlike most other urban water uses, a significant portion of industrial water supply comes from self-supplied sources. This is due to the tendency of large plants and those located outside of urban areas to use groundwater or local stream diversions

as a cheaper alternative to municipal supplies.

Water use in industrial establishments can be correlated with the number of employees. For water use forecasting purposes, industrial water needs are often evaluated in terms of employment by Standard Industrial Code major group. SIC is an industrial classification of the total economy, dividing all activities into broad industrial divisions, major groups, subgroups, and individual industries. Table 2 shows statewide manufacturing water use per employee from the 1994 survey.

Table 2. Manufacturing Water Use by Major Industrial Group
(gallons/employee/working day)

SIC	Major Industrial Group	Unit Water Use
20	Food and kindred products	2,096
21	Tobacco products	1,486
22	Textile mill products	1,174
23	Apparel and other products made from fabrics and similar materials	26
24	Lumber and wood products, except furniture	1,714
25	Furniture and fixtures	179
26	Paper and allied products	2,039
27	Printing, publishing, and allied industries	313
28	Chemical and allied products	1,017
29	Petroleum refining and related industries	11,945
30	Rubber and miscellaneous plastic products	119
31	Leather and leather products	260
32	Stone, clay, glass, and concrete products	2,157
33	Primary metal industries	507
34	Fabricated metal products, except machinery and transportation equipment	197
35	Industrial and commercial machinery and computer equipment	124
36	Electronic and other electrical equipment and components, except computer equipment	265
37	Transportation equipment	173
38	Measuring, analyzing, and controlling equipment; photographic, medical, and optical goods; watches and clocks	127
39	Miscellaneous manufacturing industries	63

Industrial Water Use Example

Scott Matyac is a senior land and water use analyst in the Statewide Planning Branch.

Food processing represents an important category of industrial water use. This article highlights one of the food processing plants that responded to the Department's industrial water use survey. As noted in the article, wastewater disposal requirements are often a driving factor in encouraging industrial water use efficiency.

Can you name the jelly bean that was a staple in the Oval Office and on Air Force One during the Reagan Administration? If you answered Jelly Belly, you're right! Jelly Belly beans are produced in Fairfield by the Herman Goelitz Candy Company. Although best known for the Jelly Belly line, Goelitz produces about 150 different candies at its Fairfield plant. As with other food processing industries, Goelitz depends on a reliable source of high-quality water to manufacture its products.

Jelly Belly production begins from the inside out. The centers are formed from a slurry of sugar, corn syrup, cornstarch, water, color, and flavorings, which is deposited into depressions of cornstarch on moulding boards and dried overnight. After being separated from the cornstarch the next day, the centers are "sanded" by passing through a moisture steam bath and a sugar shower. After curing for 24 to 48 hours, the sanded centers are placed in rotating engrossing pans for two hours to

receive a four-layer, flavored, soft-panned shell. Then the beans are polished the following day in revolving stainless steel drums containing confectioners' glaze. Finally, the polished beans are placed into trays and seasoned for two to four days prior to packaging.

The Goelitz factory uses about 7 million gallons (21.5 af) of water per year, purchased from the City of Fairfield. The major use of water in the plant is for wash down of food processing equipment, which generates about 8,000 gallons of wastewater per day. Due to the sugar and starch content of candy, this wastewater is high in chemical oxygen demand and low in pH. (The acidity of certain candy flavorings, such as those derived from citrus, also contributes to the low pH.) Typically, waste of this nature undergoes on-site pretreatment before discharge to the sanitary sewer. However, Goelitz engineers, working with staff of the nearby municipal wastewater treatment plant, devised a less costly method of collecting process wastewater in a central storage tank and transporting it by tanker truck to the treatment plant. The wastewater is metered directly into the plant's anaerobic digesters, bypassing the early stages of the treatment train. Since disposal costs are directly related to waste volume, Goelitz production procedures emphasize efficiency in water use to minimize wastewater flows from the plant.

California Rivers

Jeanine Jones is Chief of the Statewide Planning Branch

An earlier newsletter issue reviewed the increasing interest in watershed-based planning programs. With this issue, we begin a periodic feature highlighting some of California's river basins.

How many rivers are there in California? This question is not as simple as it seems. A person examining a detailed map of California would see about 110 waterbodies labelled as rivers. Some of these rivers are quite small. Some waterbodies identified as streams or creeks on a detailed map of California are larger than many small rivers. Some map features labelled as rivers are ephemeral waterbodies which contain water only during occasional flash floods. There are also instances of rivers with duplicate names. There are, for example, two each of the Bear River, Fall River, New River, Little River, and Roaring River. Many of California's rivers are tributaries of other rivers, and a few are distributaries (such as the Saint Johns River, a distributary of the Kaweah River). This article will begin at the beginning of the alphabet and will briefly cover rivers whose names start with the letter "a"—the Alamo, Albion, Amargosa, American, and Applegate Rivers.

The Alamo River, located in Imperial County, flows north from the U.S.-Mexico border to terminate in the Salton Sea. Most of the river's flow is provided by agricultural drainage water from the Mexicali and Impe-

rial Valleys. The Alamo River is one of the two major fresh water sources for the Salton Sea; the lower river and the sea provide important wintering habitat for many species of migratory waterfowl and shorebirds. Part of the Imperial State Wildlife Area is located along the river's channel, and the Salton Sea National Wildlife Refuge is located on the shore of the sea near the Alamo's delta.

The Albion River is a small river that begins in the coastal mountains of Mendocino County and joins the Pacific Ocean a few miles south of the town of Mendocino. Several nearby coastal creeks are larger than this river.

The Amargosa River is California's fourth largest river (based on watershed area). It is also one of California's driest rivers. The Amargosa traverses the floor of Death Valley, and its watershed includes the adjacent mountain ranges in California and in Nevada. The watershed area within California is 6,442 square miles. The river's name (amargosa means "bitter" in Spanish), and that of the site of Badwater on the valley floor, reflect the highly mineralized condition of the valley's minimal surface waters.

The American River, a major tributary of the Sacramento River, has an important place in California history. The discovery of gold on the South Fork generated the 1849 gold rush that led to California's statehood in 1850. Water development facilities in the river basin include the U.S. Bureau of



Photo courtesy of DWR Photo Lab

Alamo River entering the Salton Sea

Reclamation's 1 maf Folsom Reservoir, 41 thousand acre-foot Jenkinson Lake, and 7 taf Sugar Pine Reservoir (all Central Valley Project facilities), and local agency hydropower and water supply reservoirs. The lower American River below Nimbus Dam and part of the North Fork above

Folsom Reservoir have been included in the State and federal Wild and Scenic Rivers systems.

The Applegate River originates in California and flows into Oregon to join the Rogue River. Only a small part of the river's upper watershed is in California.

Effects of El Niño on California Seals and Sea Lions

Jennifer Hogan is an environmental specialist with the Environmental Services Office.

The 1997-98 El Niño effect has received great press attention, largely focused on its potential flooding and water supply implications. The ocean temperature changes associated with El Niño events can also affect marine life, as described in this article.

Warming of ocean waters (about 10° F above average levels) can affect the marine food chain. Species that are mobile can search for food in colder waters, either in more northern locations or deeper in the ocean. Species that are not mobile can die off due to lack of nutrients. Nitrates, the vital nutrient that would normally be upwelled from deeper water to shallow, are essential for the growth of kelp plants, phytoplankton, and zooplankton. Pinnipeds (seals, sea lions, fur seals) feed upon sea creatures such as anchovies, squid, hake, octopus, sardines, and lantern fish. Since these fish feed upon smaller organisms that require kelp and plankton for food, a domino effect of malnutrition reaches all the way up through the food chain to seabirds, large fish, and marine mammals.

During El Niño events, fish populations preyed upon by pinnipeds move to colder waters or decline in numbers due to lack of food. El Niño conditions affect California's pinniped populations by limiting or reducing the food source, affecting the survival rate of the very young. Impacts are similar for all pinniped species. Females with preweaned pups must spend

longer hours foraging for food. While the amount of food foraged may be the same as in normal years, the energy expended to obtain the food and the longer foraging episodes contribute to less milk production and thus fewer calories for the growing pups. Biologists studying elephant seals found that females lose an average of 42 percent of their initial body mass over the breeding season while nursing a single pup. The milk of pinnipeds generally contains 45 percent fat, a very large amount of calories to accumulate in the mother before she can pass it on to her pups. Furthermore, females may not have the energy stores to complete a pregnancy, so the number of live births may decrease during these time periods.

Juveniles, those animals just beyond weaning, may not have the energy stores to withstand prolonged foraging, or their smaller size may preclude them from diving deep enough to reach the colder waters and more abundant prey. Thus, they are more likely to become malnourished or to contract a disease.

Biologists studying the effects of El Niño events on pinnipeds witnessed these impacts during the last intense El Niño event in 1982-83 and are beginning to see them again. The Marine Mammal Center near Sausalito reports a fivefold increase this year in the number of northern fur seals rescued off the northern coast. Susan Andres, a spokesperson for the Center, says that these animals are an indicator species for El Niño events, i.e., the first pinniped species in Northern California to show the impacts of a warm water anomaly. Harbor seal pups are also impacted by El Niño events. A study using

12 years of recent data collected from the Marine Mammal Center found a positive correlation between El Niño sea surface temperatures and an increase in strandings of these animals. Strandings appear to be due to the poor foraging conditions, which can result in poor physical condition of the young animals, complicated by disease and abandonment by mothers.

There are also abnormally high numbers of California sea lions dying on San Miguel Island, off the California coast near Santa Barbara. This island contains the California coast's largest seal and sea lion population and is probably characteristic of many of the other islands from central to northern California. Biologists studying the effects of El Niño on this island predict that the death rate of sea lions will jump from about 45 percent of natal pups to about 60 or 70 percent of this year's sea lion births. San Miguel Island also contained a large population of northern fur seals, up until the 1982-83 El Niño event, when the population crashed from about 3,600 animals on land to less than 1,500 in one year. Michelle Souza, spokesperson for the Monterey Bay Aquarium in Monterey, and Debbie Zmarsly, Science Specialist at the Scripps Institution of Oceanography in La Jolla, have not yet noticed El Niño effects at their respective institutions, but both believe that the impacts will be felt by the end of the winter. However, El Niño events have probably been happening for as long as these animals have been evolving. Since the decline of commercial harvesting of pinnipeds due to the Marine Mammal Protection Act of



Photo courtesy of Jennifer Hogan

Guadalupe fur seal at the Marine Mammal Center

1972, populations have been stabilizing, if not increasing.

For more information on the latest El Niño developments, contact the National Oceanic and Atmospheric Administration's website at <http://nic.fb4.noaa.gov>. For further information on the effects of this winter's El Niño event on the pinnipeds of Northern California, or if you would like to become a volunteer, contact the Marine Mammal Center at the Marin Headlands near Sausalito, California, at (415) 289-7325. To learn more about the effects on pinnipeds as well as cetaceans (whales and dolphins) in Southern California, contact the Scripps Institution of Oceanography in La Jolla, California, at website at <http://aqua.ucsd.edu>.

Inflatable Dams

Donald H. Babbitt is a principal engineer in the Division of Safety of Dams.

This article reviews technological progress in the use of inflatable dams. Although much less common than flashboard structures that may serve similar purposes, inflatable dams are being used more often in certain specialty applications. Readers of CALFED's draft environmental document for its Bay-Delta Program will see mention, for example, of inflatable rubber dams in conjunction with potential levee modifications.

Rubber Dam No. 3 is a representative example of a modern inflatable dam. Alameda County Water District constructed the 13-foot-high, 375-foot-long dam in 1989 on Alameda Creek in the City of Fremont. The dam impounds a 154 af reservoir for direct groundwater recharge and diverts flows into adjacent spreading grounds in former aggregate pits.

The air-inflated dam is bolted to a reinforced concrete slab that was constructed across the stream channel. To clear the leveed channel for floodflows, the dam is deflated by District personnel, or it automatically deflates slowly when overtopped by substantial flows. The dam is reinflated when streamflows subside to safe levels and any water-borne debris has passed the dam. These operations are much easier and safer than alternatives such as installing, tripping, and reinstalling hinged flashboards.

Inflatable dams were developed and first used in the 1950s in the Los Angeles area. They were typically inflated with water. Since that time, construction materials and control systems have been improved and features have been added,

such as fins to reduce vibrations during overflow. Air is now the preferred inflation medium. The manufacturers report that there are about 1,900 of these dams worldwide, 50 in the United States.

Other uses of inflatable dams have evolved. In 1988, Pacific Gas and Electric Company replaced flashboards on Pit No. 3 Dam with 6-foot-high inflatable dams. The U.S. Bureau of Reclamation recently replaced two 18-foot-high by 100-foot-long drum gates on the crest of Friant Dam with Obermeyer gates. The latter gates are steel panels, connected to the dam crest by hinges along their upstream edge, and raised and lowered by air-inflated bladders.

California has regulated nonfederal dams for safety since 1929. (The Legislature enacted dam safety legislation then, in response to the failure of Saint Francis Dam in 1928.) Currently more than 1,200 dams are regulated. Division 3 of the California Water Code assigns the dam safety responsibility to the Department. The Water Code describes dams as barriers 25 feet or more in height having impounding capacities of more than 15 af, or barriers more than 6 feet in height having impounding capacities of 50 af or more. The Code provides some exemptions from State regulation, including barriers in the channel of a stream or watercourse which are 15 feet high or less that have the single purpose of spreading water for percolation. Rubber Dam No. 3 would be exempt from regulation if it did not serve the diversion function. The Division of Safety of Dams reviewed and approved the plans and specifications for the Rubber Dam No. 3 and Pit No. 3 Dam installations, supervised the construction, and makes periodic maintenance inspections of the dams.

Status Update — Studies to Enlarge Shasta Dam

Waiman Yip is a senior engineer with the Statewide Planning Branch.

Recent reexamination of the potential for raising Shasta Dam has brought increased public interest to a water management option that was last evaluated in the early 1980s. This article summarizes the enlargement alternatives being reviewed.

Shasta Dam, located on the Sacramento River 12 miles north of the City of

Redding, is the keystone of the U.S. Bureau of Reclamation's Central Valley Project. The dam, completed in 1945, impounds California's largest reservoir. Originally, the reservoir capacity had been planned to be about 8 maf, but economic conditions in the 1930s caused USBR to limit reservoir capacity to its present size of 4.55 maf. The present storage capacity is about 80 percent of the long-term average annual runoff at the damsite. Consequently, there is unregulated runoff available for storage in most years.

continued on page 12

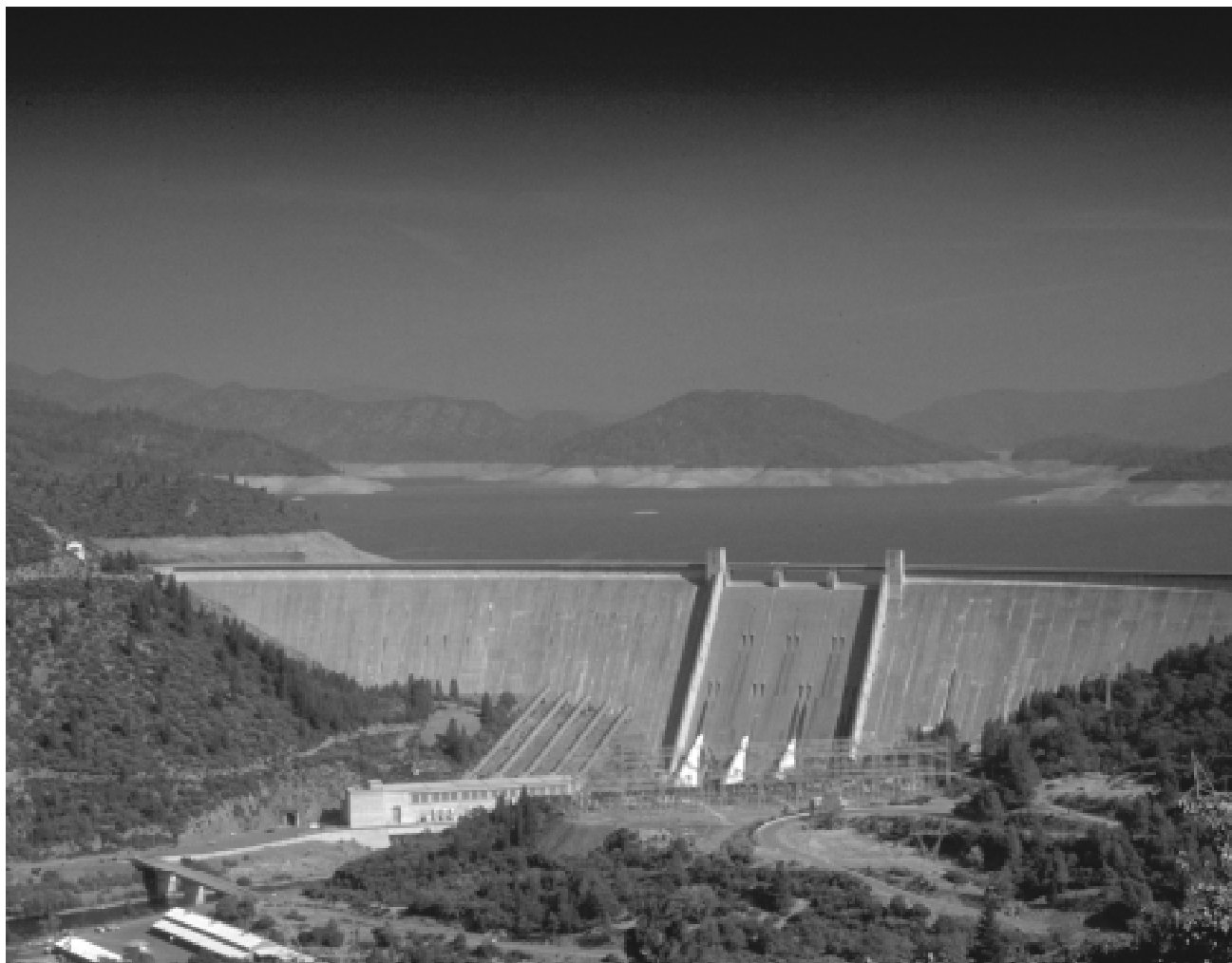


Photo courtesy of DWR Photo Lab

Looking upstream at Shasta Dam.

Shasta Dam (continued from page 11)

Past studies have indicated that it is engineeringly feasible to enlarge Shasta Dam by up to 213 feet in height, providing additional storage of 9.7 maf of water. This new storage would provide about 1.4 maf of additional drought period yield. In addition to increased water supply, an enlarged reservoir would provide the opportunity to increase average annual power generation by up to 80 percent and provide additional recreation and flood control benefits.

In the early 1980s, USBR and the Department investigated the feasibility of enlarging Shasta for additional water supply for CVP and the State Water Project. The investigation found that enlargement could provide an additional 1.45 maf of annual yield at a lower unit cost than that of 24 other alternative projects. The relocation of Interstate 5 and the railroad represents more than one-third of the construction costs required to enlarge the reservoir to this size. At the time, the demand for additional water supply was not great enough to warrant the high capital costs, and the investigation was suspended in 1984.

Current assessments by USBR and CALFED cover the full spectrum of possible enlargement sizes, as shown by the range of options below.

- Redesigning the existing radial gates to raise them up to 17 feet to provide about 500 taf of additional storage. This would not require substantial modifications to Interstate 5 or to the railroad.

- Enlarging the existing dam to provide about 1.0 maf of additional storage. While this approach would require only minimal changes to the freeway alignment, it would require substantial bridge modifications.
- Raising the dam by 213 feet in height, adding 9.7 maf of storage capacity. This option, previously considered by USBR and the Department, would require relocation of portions of the freeway and the railroad.

CALFED conducted a prefeasibility evaluation of Shasta Reservoir enlargement as part of the storage component of its Bay-Delta Program, considering two levels of enlargement—to 6.75 maf and to 14.3 maf. Updated cost estimates indicate that the capital cost of enlarging Shasta Lake to 14.3 maf would be about \$5.5 billion (this would provide an additional yield of 1.45 maf at an annual cost of about \$350 per af). The analysis did not include costs to mitigate for environmental impacts.

Some significant environmental impacts would include:

- Flooding of about 42 miles of stream habitat, as well as riparian and wetland habitat. While lake fisheries would probably improve, stream fisheries would be impacted along 6 miles of the McCloud River, 16 miles of the Sacramento River, and a portion of Squaw Creek.
- Flooding of about 30,000 acres of wildlife habitat which would impact deer and elk herd winter range.

- Affecting several rare, endangered, or threatened species. A number of State or federally listed fish and wildlife species are known to exist within the area of the proposed enlargement. Listed species include the Shasta salamander, rough sculpin, and bald eagle.

- Inundating many archeological (335) and ethnographic (126) sites.

More detailed evaluation of enlarged Shasta alternatives would require further work on the costs of environmental mitigation and of transportation facility relocations.

Evolution of Fair Oaks Water District

Barry Brown is the senior member of the Fair Oaks Water District's Board of Directors, having served 12 years. He recently retired as an Irrigation Engineer for the Ag America/Western Farm Credit Bank, serving five western states. Prior to that engagement, Barry worked with the Department of Water Resources, California Energy Commission, and the Department of Conservation on a variety of water and other natural resource planning issues.

This article is the second in our periodic series of articles on water supply concerns as viewed by members of boards of directors of local water agencies. The first article in the series covered a very large urban water wholesaler. This second article captures the perspective of a small urban retailer.

The rural/residential community of Fair Oaks, east of Sacramento, has seen many changes since its first settlers arrived in 1896. Unlike many urban areas, however, Fair Oaks never actively embraced changes. Instead, it recognized that change was inevitable and focused on controlling it to maintain its unique characteristics. When I was elected to the Fair Oaks Water District Board in 1986, a similar minimal change philosophy prevailed in the District. Just enough effort

was being put forward to keep the District operating on a day-to-day basis at minimal cost. This is the story of how a water district with a very limited mission in 1986 has changed drastically.

In 1896, the Howard-Wilson Publishing Company of Chicago began advertising land in the Fair Oaks area for sale. An advertisement in a March 1886 magazine listed the many virtues of Sunset Colony (Fair Oaks)—no saloons, grand scenery, moral and well-to-do people, flowers that bloomed perpetually, perennial fruits and vegetables, no frosts or blizzards, and the best fruit region in the world. By the end of 1897, a thousand acres of land had been cleared and planted in oranges, olives, almonds, and other crops. In 1917, the Fair Oaks Irrigation District was formed to provide water for irrigation and domestic use. Two years later it purchased the main water distribution system in the area at a price of \$62,000. By 1979, essentially all of the significant agricultural land in the District had been replaced with low-density residential development. The District's name was changed to the Fair Oaks Water District in that year.

continued on page 14

Fair Oaks Water District (continued from page 13)

Until 1952, the District was governed by a three-member elected board of directors. Since then, the board has consisted of five members elected from geographical divisions of the District for four-year terms. The District covers 6,052 acres and serves the community with a staff of 26 year-round and several seasonal employees. The District receives treated surface water from the U.S. Bureau of Reclamation's Folsom Reservoir via its wholesaler, the San Juan Water District, and distributes the water to over 13,000 connections. The District also maintains 8 wells, 178 miles of pipeline, a 3 million-gallon water tank, and is currently installing a state-of-the-art telemetry system.

My motivation for becoming a director 12 years ago was fueled by growing awareness that the District was badly in need of modernization and not well positioned to deal with looming regional, State, and federal water issues. Having spent a career in addressing such issues, I felt that I could help the board become better organized and strengthen its ability to prepare for the future.

During these 12 short years, the District has undergone a major transformation. It began this period with no written policies or procedures, no master plan, no District manager, no computers, no public relations efforts, a badly deteriorating infrastructure, an unacceptable emergency water supply, unacceptable water pressure variations, a poorly maintained water well system, a need for improved employee/management relations, very little training for employees, insupportable

water rates, and an aging single pipeline supplying surface water from its wholesaler. Since then it has broken out of its minimal change shell and has aggressively sought changes designed to place it in the forefront of progressive management and operations.

Today, essentially all of these problems either have been corrected or are being addressed. In the area of management, changes have been particularly significant. The old strict command-and-control style has been replaced with employee empowerment wherever possible. Supporting this style is a much-expanded employee training program. In the near future, a pay-for-performance plan will be put into effect. In the financial area, the District has hired a controller to enhance its ability to explore increasingly complex monetary issues.

In 1988, the District adopted a master plan for its water system through the year 2010. The major feature of the plan was a \$10 million capital improvement program to address the shortcomings of its distribution system. Today, more than 85 percent of the work has been accomplished. The District now has a redundant surface water supply line from its wholesaler, a 3 million-gallon water storage tank for controlling water pressures and providing emergency water, water pressure zones, completely rehabilitated pump/well systems for emergency/supplemental water, and 90 percent replacement or rehabilitation of old water lines. Before the end of the year, the District will be installing a telemetry system to tie all the major components of the delivery system to a central

control location. Another major activity scheduled for completion this year is a detailed vulnerability assessment of the District that will be the basis for an emergency response plan.

An underlying principle that has guided the board in getting its house in order is to explore cooperative efforts with our neighboring districts—efforts that could lead to better and more cost-effective solutions than would be possible by ourselves. We believe strongly in regional planning and the need for water entities to take the initiative, rather than to have requirements imposed legislatively. A sufficient number of districts now agree that it is time to develop a master water plan for the north area. We have hired a consultant and a program manager to carry out a two-phase, two-year planning effort. Running concurrently with the first phase of the planning effort is a committee exploration of the need for, and makeup of,

a governance body to oversee implementation/management of approved plans.

It is apparent that the Fair Oaks Water District board believes change is an absolute necessity if a district is to keep pace with the ever increasing demands and complexity of the water business. It is also apparent that the board has a strong conviction that districts must be in a position to manage change to the extent possible. To accomplish this, managers and board members need to constantly seek more effective ways of running their organizations. In addition, managers and board members need to be active participants in regional, State, and federal organizations and activities where a potential exists to influence the outcome of matters of interest to them. And finally, districts should be prepared to assume a leadership role to achieve their objectives when other efforts are not producing results.

Statewide Statistics

January 1998 marked the sesquicentennial of the discovery of gold at Sutter's Mill on the American River, a discovery that led to the gold rush of 1849 and California's statehood in 1850. Shown below are some dates from the first 50 years of California's statehood.

1854	Legislature recognizes pueblo water rights of Los Angeles.
1861	Legislature authorizes formation of reclamation districts.
1871	First reported construction of a dam on Lake Tahoe.
1884	Hydraulic mining is banned because of its impacts on navigation and contribution to flooding.
1886	Lux v. Haggin addresses the competing water rights doctrines of riparianism and prior appropriation.
1887	Legislature enacts the Wright Irrigation District Act.
1887	Turlock Irrigation District becomes first irrigation district formed under the Wright Act.
1895	World's first long-distance transmission of electric power (22 miles), from a 3 kW hydropower plant at Folsom (on the American River) to Sacramento.



State of California
The Resources Agency
Department of Water Resources

Division of Planning and Local Assistance
P.O. Box 942836
Sacramento, CA
94236-0001



ADDRESS CORRECTION REQUESTED